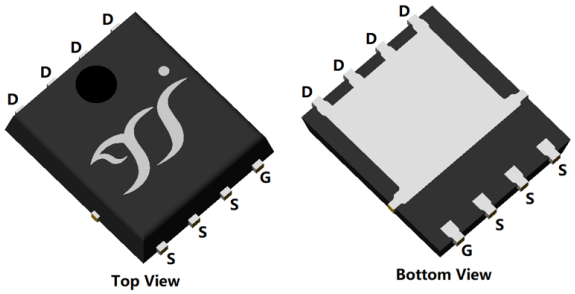
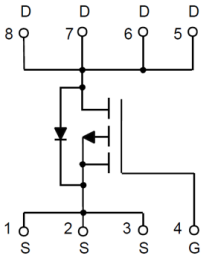
P-Channel Enhancement Mode Field Effect Transistor



PDFN5060-8L



Product Summary

- V_{DS} -40V
- I_D -50A
- $R_{DS(ON)}$(at V_{GS}=-10V) ＜13mΩ
- $R_{DS(ON)}$(at V_{GS}=-4.5V) ＜19mΩ
- 100% EAS Tested
- 100% ▽V_{DS} Tested

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply

■ Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage	T_J ≥ 25 °C; T_J≤ 150 °C		V_{DS}	-	-40	V
Gate-source Voltage	T_J≤ 150 °C; DC		V_{GS}	-20	20	
Continuous Drain Current	Steady-State	T_A=25℃, V_{GS}= 10V	I_D	-	-8	A
		T_A=100℃, V_{GS}= 10V		-	-5	
Continuous Drain Current	Steady-State	T_C=25℃, V_{GS}= 10V		-	-50	
		T_C =100℃, V_{GS}= 10V		-	-31	
Pulsed Drain Current [A]	T_C=25℃, t_p≤10μs		I_{DM}	-	-200	
Maximum Body-Diode Continuous Current			I_S		-50	
Avalanche energy [B] (non-repetitive)	V_G=-10V, R_G=25Ω, L=2mH, IAS=-15A		EAS	-	225	mJ
Total Power Dissipation [C]	Steady-State	T_A=25℃	P_D	-	2.2	W
		T_A=100℃		-	0.9	
Total Power Dissipation [C]	Steady-State	T_C=25℃		-	83	
		T_C =100℃		-	33	
Junction and Storage Temperature Range			T_J ,T_{STG}	-55	150	℃

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [D]	Steady-State	$R_{θJA}$	45	55	℃/W
Thermal Resistance Junction-to-Case	Steady-State	$R_{θJC}$	1.2	1.5	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJG50P04AJ	F1	YJG50P04AJ	5000	10000	100000	13“ reel

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=-250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=-250μA	-1	-1.4	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-20A	-	10	13	mΩ
		VGS =-4.5V, ID =-20A		13	19	mΩ
Diode Forward Voltage	V_{SD}	I_S=-20A, V_{GS}=0V	-	-0.86	-1.2	V
Gate resistance	R_G	f=1MHz	-	9	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-25V, V_{GS}=0V, f=1MHz	-	3300	-	pF
Output Capacitance	C_{oss}		-	300	-	
Reverse Transfer Capacitance	C_{rss}		-	225	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-20V, I_D=-25A	-	73	-	nC
Gate-Source Charge	Q_{gs}		-	8.9	-	
Gate-Drain Charge	Q_{gd}		-	15.3	-	
Reverse Recovery Charge	Q_{rr}	I_F=-25A, di/dt=100A/us	-	12.8	-	nC
Reverse Recovery Time	t_{rr}		-	25.4	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V, V_{DD}=-20V, I_D=-25A R_{GEN}=6Ω	-	13.6	-	ns
Turn-on Rise Time	t_r		-	11.8	-	
Turn-off Delay Time	$t_{D(off)}$		-	201.5	-	
Turn-off fall Time	t_f		-	92.5	-	

A. Repetitive rating; pulse width limited by max. junction temperature.
B. T_J=25℃, V_{DD}=-30V, V_G=-10V , L=2mH, IAS=-15A.
C. P_d is based on max. junction temperature, using junction-case thermal resistance.
D. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in the still air environment with T_A =25℃. The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■Typical Electrical and Thermal Characteristics Diagrams

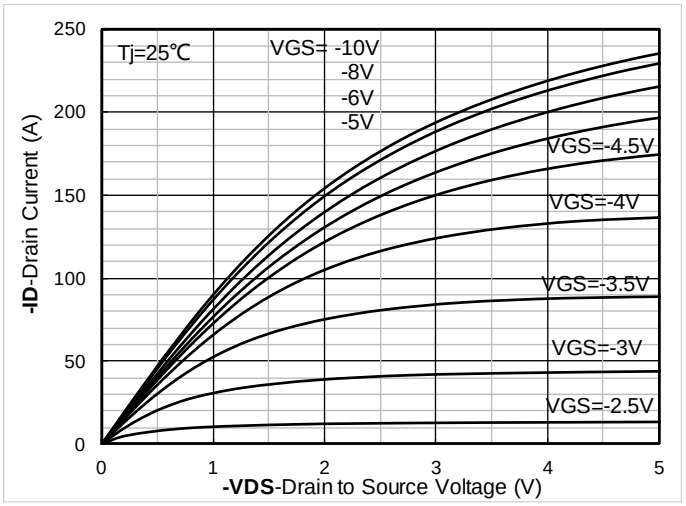


Figure 1. Output Characteristics

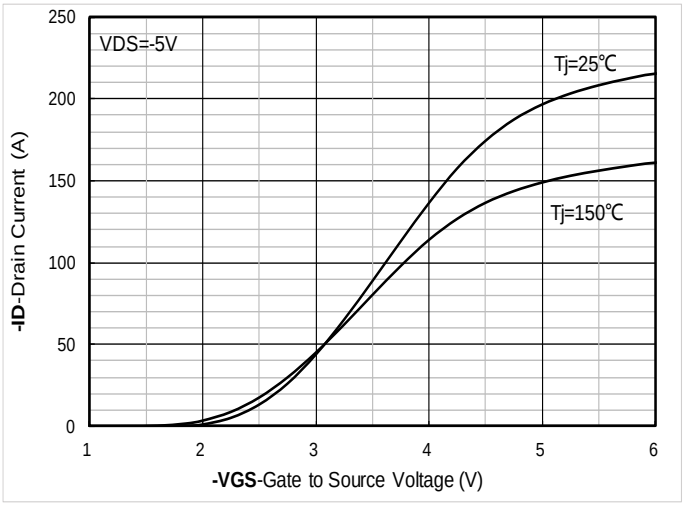


Figure 2. Transfer Characteristics

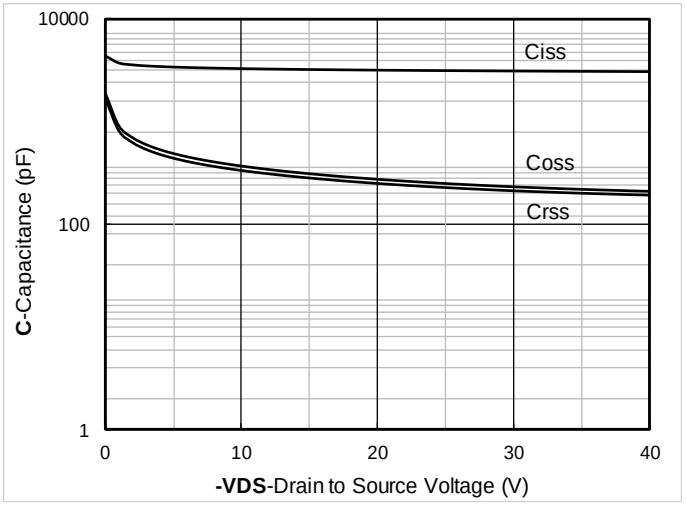


Figure 3. Capacitance Characteristics

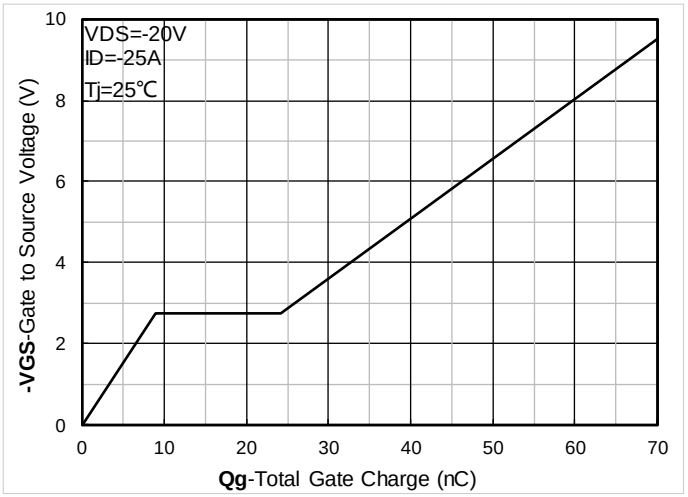


Figure 4. Gate Charge

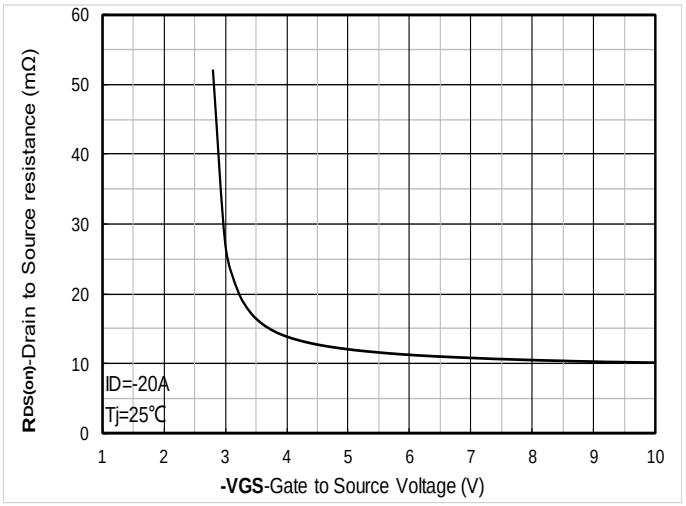


Figure 5. On-Resistance vs Gate to Source Voltage

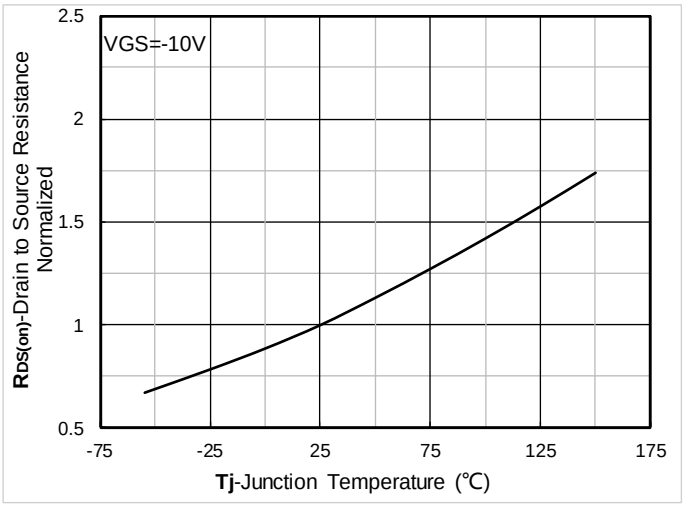


Figure 6. Normalized On-Resistance

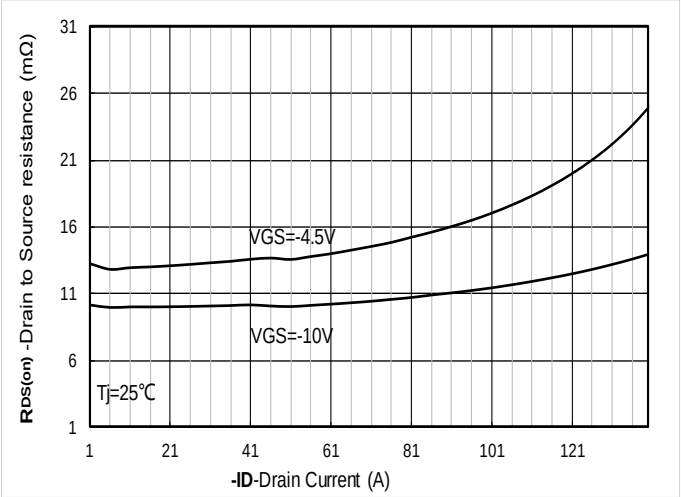


Figure 7. $R_{DS(on)}$ VS Drain Current

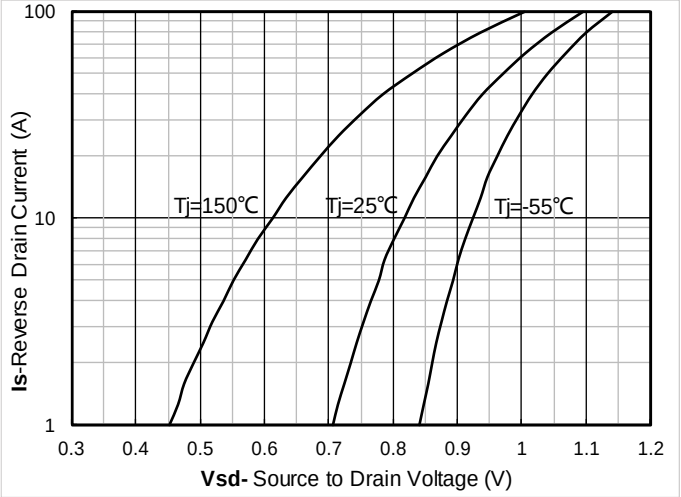


Figure 8. Forward characteristics of reverse diode

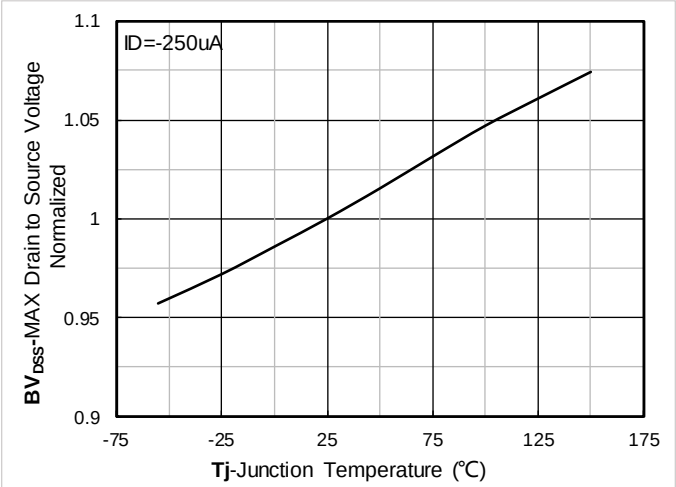


Figure 9. Normalized breakdown voltage

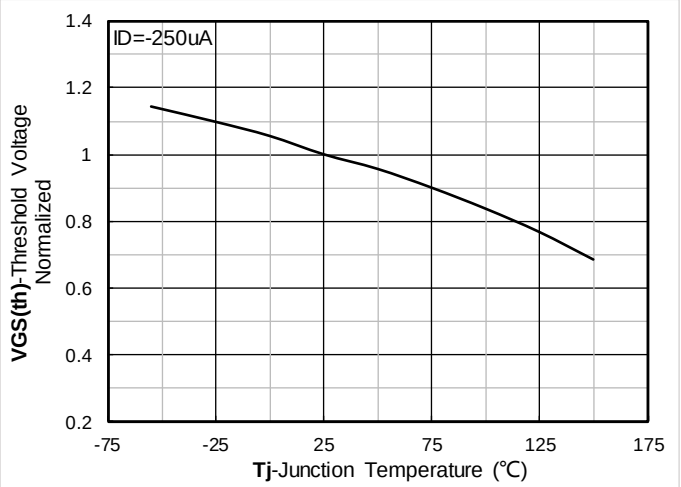


Figure 10. Normalized Threshold voltage

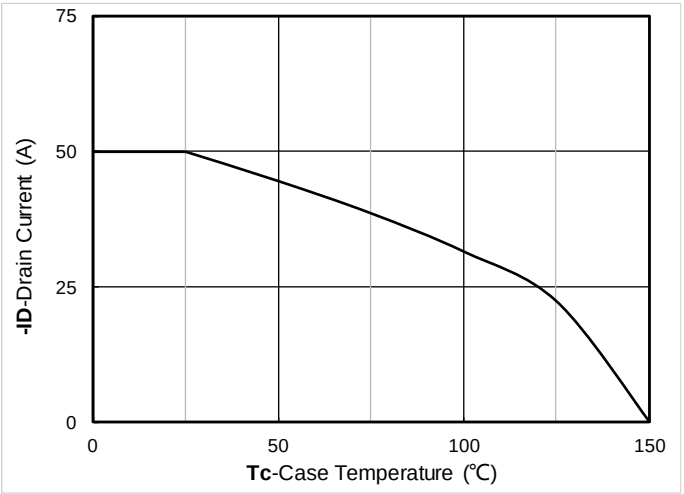


Figure 11. Current dissipation

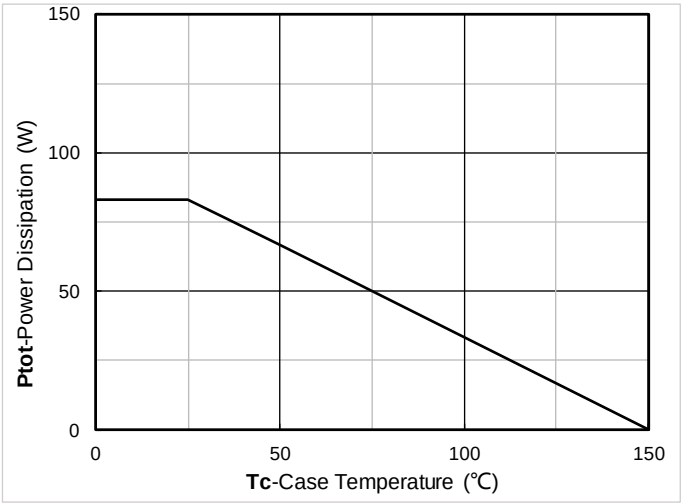


Figure 12. Power dissipation

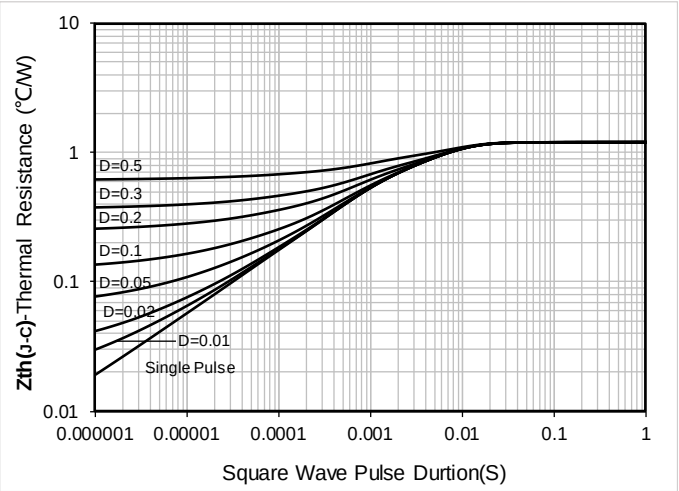


Figure 13. Maximum Transient Thermal Impedance

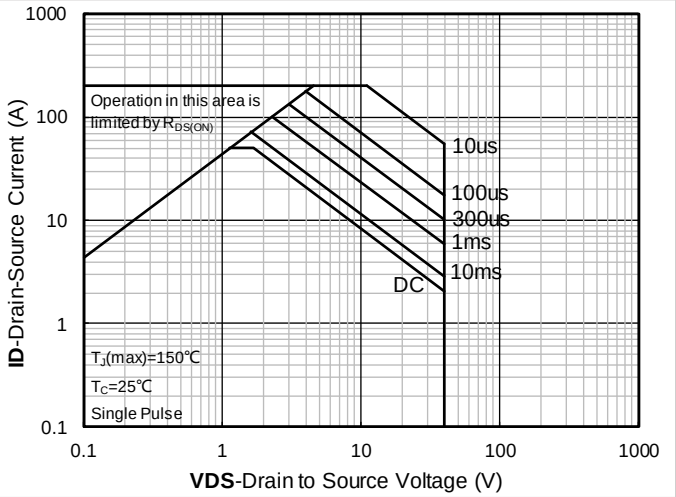
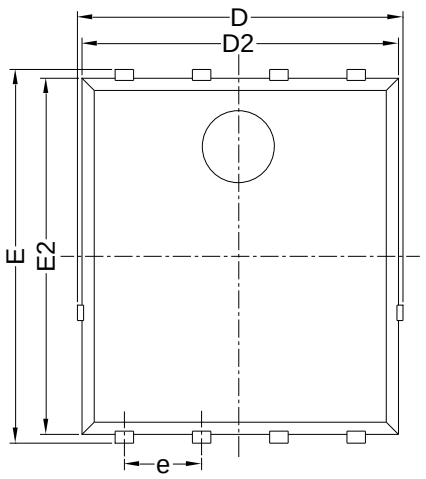
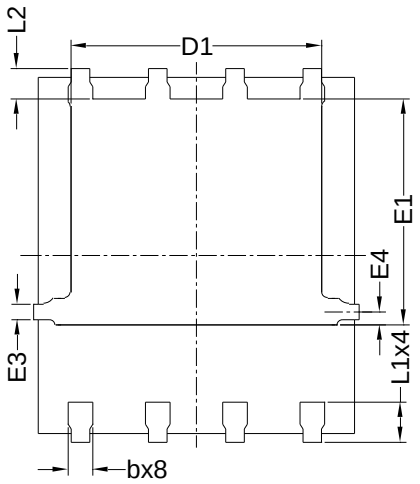


Figure 14. Safe Operation Area

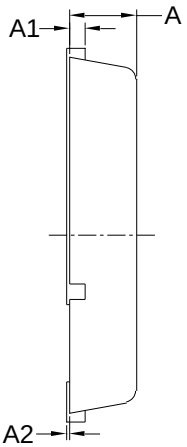
■ PDFN5060-8L-1.1MM Package information



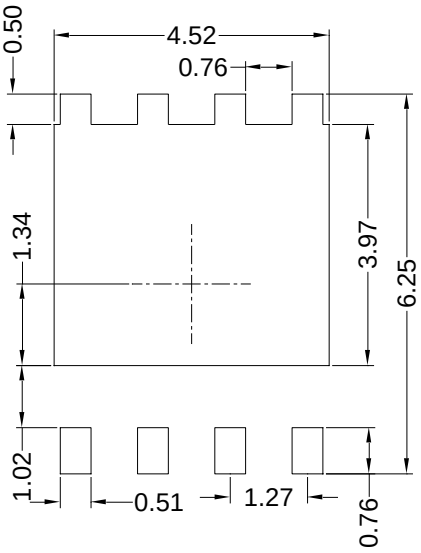
Top View
正面视图



Bottom View
背面视图



Side View
侧面视图



Suggested Solder Pad Layout
Top View

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	5.15	5.35	5.55
E	5.95	6.15	6.35
A	1.00	1.10	1.20
A1		0.254 BSC	
A2			0.10
D1	3.92	4.12	4.32
E1	3.52	3.72	3.92
D2	5.00	5.20	5.40
E2	5.66	5.86	6.06
E3		0.254 REF	
E4		0.21 REF	
L1	0.56	0.66	0.76
L2		0.50 BSC	
b	0.31	0.41	0.51
e		1.27 BSC	

Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.10mm.
3.The pad layout is for reference purposes only.

Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website http://www.21yangjie.com , or consult your nearest Yangjie's sales office for further assistance.